CLAIMS

1. A method for improving the signal-to-noise ratio (S/N) in a system for measuring flatness of a strip of rolled material, said system comprising at least one signal processor for determining said flatness and a measuring roll, having a number of measuring devices for force and pressure registration, each said device generating measurement output signals (U_{pi}) depending on the contact between the strip and the measuring roll, wherein each said measurement signals (U_{pi}) comprises a force component signal (U_{Fi}) and a noise signal component, said method comprising the step of:

- generating measurement output signals (U_{pi}) by means of each measuring device depending on the contact between the strip and the measuring roll;
- determining a time length (T_{tot}), based on the measurement output signals (U_{pi})
- generating a time slot having the determined time length (T_{tot});
- synchronizing said time slot to the appearance of a force component (U_{Fi}) on an input of at least one quantity processor of said signal processor; and
- controlling at least one quantity processor to be open for registration of an incoming force component signal (U_{Fi}) during said time slot and be closed until the next successive time slot appears.

2. A method according to claim 1, wherein, said method comprises the steps of:

- generating a mean value signal (U_A) using the force component signals (U_{Fi}) which are generated within a time interval (T_g), from a number of the measurement output signals (U_{pi}); and

- determining a time length (T_{tot}), based on the mean value signal (U_A).

3. A method according to claim 2, wherein, said method comprises the steps of:

- adding a number n, n being a positive integer, of measurement output signals (U_{pi}) generated within a small time period (T_g) to a mean value determining circuit comprising at least one summation circuit for producing a summation signal (U_s);

- connecting said summation signal (U_s) to a dividing circuit for dividing (U_s) by the integer n, where n equals the number of added signals (U_{pi}) to the summation circuit; and

- producing a mean value signal (U_A) by said dividing circuit.

4. A method according to claim 2, wherein, said method comprises the step of:

- adding a number n, n being a positive integer, of measurement output signals (U_{pi}) generated within a time

period (T_g) to the mean value determining circuit comprising a microprocessor and applied software, stored in a memory that is connected to said microprocessor, wherein the software is adapted for calculating a mean value from a number of measurement output signals (U_{pi}).

5. A method according to claim 3, wherein, said method comprises the step of:

- storing and adding, to at least one second summation circuit, a number k, k being a positive integer, of consecutive mean value signals (U_A) to each other for further improvement of the S/N ratio.

6. A method according to claim 5, wherein, the method comprises the step of:

- signal treating of the mean value signal (U_A) by means of at least one of filtering and demodulating and rectifying the mean value (U_A).

7. A device for improving the signal-to-noise ratio (S/N) in a system for measuring flatness of a strip of rolled material, said system comprising at least one signal processor for determining said flatness and a measuring roll, having a number of measuring devices for force and pressure registration, each said device generating measurement output signals (U_{pi}) depending on the contact between the strip and

the measuring roll, wherein each said measurement output signals (U_{pi}) comprises a force component signal (U_{Fi}) and a noise signal component, and wherein the device comprises:

a position synchronization processor arranged for determining a time length (T_{tot}) based on the measurement output signals (U_{pi}) for generating a time slot having the determined time length (T_{tot}), for synchronizing said time slot to the appearance of a force component signal (U_{Fi}) on an input of at least one quantity processor of said signal processor and for controlling at least one quantity processor to be open for registration of incoming force component signals (U_{Fi}) during said time slot and be closed until the next successive time slot appears.

8. A device according to claim 7, further comprising: a mean value determining circuit generating a mean value signal (U_A) to the position synchronisation processor using the force component signals (U_{Fi}) which are generated within a time interval (T_g), from a number of said measurement output signals (U_{pi}).

9. A device according to claim 8, wherein, said mean value determining circuit comprises: at least one summation circuit for adding a number n, n being an positive integer, of measurement output signals (U_{pi}) generated within said time period (T_g), said summation circuit producing a summation

signal (U_S), which is connected to a dividing circuit for dividing (U_S) by integer n, where n equals the number of added signals (U_{pi}) to the summation circuit, said dividing circuit producing a mean value signal (U_A).

10. A device according to claim 8, wherein, said mean value determining circuit comprises: a microprocessor and applied software, stored in a memory connected to said microprocessor, the software adapted for calculating a mean value from a number of signals (U_{pi}).

11. A device according to claim 9 further comprising: at least one second summation circuit for storing and adding a number k, k being a positive integer, of consecutive mean value signals (U_A) to each other for further improvement of the S/N ratio.

12. A device according to claim 11, further comprising: a signal treatment device comprising at least one of a filter device, a demodulating device; and a rectifying device for signal treatment of the mean value signal (U_A).

13. A device according to claim 9, wherein the position synchronisation processor is responsive to the mean value signal (U_A) for determining the wrap angle (a) which is used in the system for determining the flatness.

14. The use of a device according to claim 7 in a rolling mill.

15. A computer program product containing software for carrying out the steps of claim 1.

16. A flatness determination signal for improving the signal-to-noise ratio (S/N) in a system for measuring flatness of a strip of rolled material and derived from at least one measurement signal (U_{pi}) wherein each separate measurement signal (U_{pi}) is generated by a corresponding measuring device of all measuring devices belonging to at least one of all measurement zones of a measuring roll and comprises one or more measurable values for calculating at least one of following quantities or vectors: strip tension vector **T**, wrap angel a, distributed force vector $\mathbf{F_2}$, force vector $\mathbf{F_{mi}}$, flatness vector $\mathbf{Ds}_1$ N/mm^2 and/or a corresponding quantity flatness vector $\mathbf{Ds}_2$ I-unit.

17. A flatness determination signal according to claim 16, wherein said flatness determination signal comprises an input signal to a flatness determination unit for calculating at least one of said quantities or vectors.

18. A flatness determination signal according to claim 17, wherein said flatness determination signal comprises a force component signal (U_{Fi}).

19. A flatness determination signal according to claim 18, said force component signal (U_{Fi}) includes a train of electrical pulses.

20. A flatness determination signal according to claim 16, wherein a number of said separate measurement signals (U_{pi}), each include a train of electrical pulses, synchronized and combined to a flatness determination signal for calculating at least one of said quantities or vectors.

21. A system for measuring flatness of a strip of rolled material, said system comprises at least one signal processor for determining said flatness and a measuring roll, having a number of measuring devices for force and pressure registration, said devices generating measurement output signals (U_{pi}) depending on the contact between the strip and the measuring roll, wherein said measurement output signal (U_{pi}) has a force component signal (U_{Fi}) and a noise signal component, and a device for improving the signal-to-noise ratio (S/N), comprising a position synchronisation processor arranged for determining a time length (T_{tot}) based on the measurement output signals (U_{pi}) for generating a time slot

having the determined time length (T_{tot}), for synchronising said time slot to the appearance of a force component signal (U_{Fi}) on an input of at least one quantity processor of said signal processor and for controlling at least one quantity processor to be open for registration of a incoming force component signals (U_{Fi}) during said time slot and be closed until the next successive time slot appears.

22. A system according to claim 21, wherein said device comprises: a mean value determining circuit generating a mean value signal (U_A) to the position synchronisation processor using the force component signals (U_{Fi}) which are generated within a time interval (T_g), from all or a number of said measurement output signals (U_{pi}).

23. A system according to claim 22, wherein said mean value determining circuit comprises: at least one summation circuit for adding a number n, n being a positive integer, of measurement output signals (U_{pi}) generated within said time period (T_g), said summation circuit producing a summation signal (U_S), which is connected to a dividing circuit for dividing (U_S) by integer n, where n equals the number of added signals (U_{pi}) to the summation circuit, said dividing circuit producing a mean value signal (U_A).

24. A system according to claim 22, wherein said mean value determining circuit comprises: a microprocessor and applied software, stored in a memory connected to said microprocessor, the software adapted for calculating a mean value from a number of signals (U_{pi}).

25. A system according to claim 23, said device comprises: at least one second summation circuit for storing and adding a number k, k being a positive integer, of consecutive mean value signals (U_A) to each other for further improvement of the S/N ratio.

26. A system according to claim 21, wherein the device comprises: a signal treatment device comprising at least one filter device or at least one demodulating device or at least one rectifying device for signal treatment of the mean value signal (U_A).

27. A system according to claim 21, wherein the position synchronisation processor is responsive to the mean value signal (U_A) for determining the wrap angle (a), which is used in the system for determining the flatness.